

CLAIMS

I CLAIM:

1. An excimer laser with long life electrodes said laser comprising:
 - A) a laser chamber containing a laser gas comprising fluorine;
 - B) an electrode set comprising an elongated after machining annealed copper alloy cathode and an elongated after machining annealed copper alloy anode;
 - C) a circulating means for circulating said laser gas between said elongated electrode;
 - D) a pulse power electrical system for generating electrical pulses between said electrode to produce a laser gain medium.
2. A laser as in Claim 1 wherein said elongated anode is comprised of at least 70% copper and 7% aluminum.
3. A laser as in Claim 2 wherein said elongated anode also is comprised of nickel and iron.
4. A laser as in Claim 3 wherein said elongated anode is comprised of approximately 82% Cu, 10% Al, 5% Ni and 3% Fe.
5. A laser as in Claim 1 wherein said elongated cathode is comprised of at least 50% copper and at least 25% zinc.
6. A laser as in Claim 3 wherein said elongated cathode is comprised of at least 50% copper and at least 25% zinc.
7. A laser as in Claim 4 wherein said elongated cathode is comprised of at least about 70% copper and at least 25% zinc.

8. A laser as in Claim 5 wherein said elongated cathode is also comprised of lead.

9. A laser as in Claim 8 wherein said elongated cathode is comprised of approximately 61.5% copper, 35.5% zinc and 3% lead.

10. A laser as in Claim 8 wherein said elongated cathode is comprised of approximately 70% copper, 29.93% zinc and 0.07% lead.

11. A laser as in Claim 4 wherein said elongated cathode is comprised of approximately 70% copper, 29.93% zinc and 0.07% lead.

12. A process for making and using an elongated laser electrode comprising the steps of:

- A) fabricating said electrode from a copper alloy using a machining process,
- B) annealing said electrode to reduce boundary layers in said electrode,
- C) installing said electrode in a gas discharge laser chamber.

13. A process as in Claim 12 wherein said electrode is an anode and said alloy is comprised of aluminum.

14. A process as in Claim 13 wherein said alloy is also comprised of nickel and iron.

15. A process as in Claim 12 wherein said electrode is a cathode and said alloy is comprised of zinc.

16. A process as in Claim 13 wherein said alloy is also comprised of lead.

17. A process as in Claim 12 wherein said annealing step comprises heating of said electrode to a temperature of about 50oC below a softening temperature of said copper alloy.